

Notice of Allowability

Application No.

10/723,350

Examiner

Rip A. Lee

Applicant(s)

MARTIN ET AL.

Art Unit

1713

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to _____.
2. ☒ The allowed claim(s) is/are 1-26.
3. ☒ The drawings filed on 11/26/03 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 06-24-04, 11-01-04
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other: _____

EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

Claim 19

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| page 61, line 12 | replace "tetrakis(2,4-dimethyl)borate" with "tetrakis(2,4-dimethylphenyl)borate" |
| page 61, line 28 | replace "tetrakis(phenyl)borate" with "tetraphenylborate" |
| page 61, line 31 | replace "tetrakis(phenyl) borate" with "tetraphenylborate" |
| page 62, line 3 | replace "tetrakis(phenyl)borate" with "tetraphenylborate" |
| page 62, line 8 | replace "dimethyl)aluminate" with "dimethylphenyl)aluminate" |
| page 62, line 21 | replace "tetrakis(phenyl)aluminate" with "tetraphenylaluminate" |
| page 62, line 25 | replace "tetrakis(phenyl)aluminate" with "tetraphenylaluminate" |
| page 62, line 28 | replace "tetrakis(phenyl)aluminate" with "tetraphenylaluminate" |

Allowable Subject Matter

The following is an examiner's statement of reasons for allowance: Claims 1-26 are allowed over the closest references, U.S. Patent No. 6,107,230 to McDaniel *et al.*, U.S. Patent No. 4,978,730 to Maezawa *et al.*, U.S. Patent No. 5,326,837 to Kissin, and U.S. Patent No. 5,721,327 to Santi *et al.*

The present invention is drawn to a compound having the formula $(X^1)(X^2)(X^3)(X^4)M^1$ wherein M^1 is a group 4 metal, X^1 is selected from cyclopentadienyl, indenyl, fluorenyl, or substituted derivatives thereof, X^2 is $-OSnR_3$, and X^3 and X^4 are ancillary ligands as defined in the claim. The invention is also drawn to catalyst compositions comprising the claimed compound, and processes for polymerization of olefins in the presence of catalyst compositions comprising the inventive compound.

McDaniel *et al.* discloses compounds having the formula $(X^1)(X^2)(X^3)(X^4)M^1$ wherein M^1 is a group 4 metal, X^1 is selected from cyclopentadienyl, indenyl, fluorenyl, or substituted derivatives thereof, X^3 and X^4 are selected from the group consisting of halides, aliphatic groups, cyclic groups, an organometallic groups, and X^2 is defined as X^1 or X^3 and X^4 . It is the examiner's position that the subject matter of the present claims is neither anticipated nor made obvious by McDaniel *et al.* The reference focuses primarily on methods of preparing treated inorganic oxide supports with various transition metal compounds. After treatment, catalyst precursors of formula $(X^1)(X^2)(X^3)(X^4)M^1$ are deposited onto the support. The claims and specification illustrate actual embodiments used in McDaniel *et al.*, which are standard metallocenes rather than monocyclopentadienyl-type complexes of the present invention. Thus, the reference does not teach specifically stannoxy-based monocyclopentadienyl-type metal

complexes of the present invention. Furthermore, it can not be gleaned from the overall teachings of the prior art that the scope of the patent covers such metal complexes. Therefore, it would not have been obvious to one having ordinary skill in the art to arrive at the claimed compounds based on the teachings of McDaniel *et al.*

Maezawa *et al.* teaches a process of polymerization of styrene based polymers in the presence of a catalyst comprised of monocyclopentadienyl titanium complexes containing alkoxy, aryloxy, and acyloxy groups. Use of stannoxy derivatives is not disclosed in the patent.

Kissin discloses a method for preparing syndiotactic styrene in the presence of a catalyst comprised of (i) trimethylaluminum, (ii) a monocyclopentadienyl titanium complex containing halogen, alkoxy, aryl, or arylakyl ancillary ligands, and (iii) at least one organotin compound. The reference does not teach compounds of the present claims, and it is not evident that such a compound would be generated *in situ* given the polymerization conditions shown in the patent.

Santi *et al.* discloses indenyl-based half-sandwich titanium complexes of general formula $(\text{Ind})\text{TiX}^1\text{X}^2\text{X}^3$ where the indenyl ligand may be substituted or unsubstituted. Ancillary ligands X^1 , X^2 , and X^3 do not include stannoxy ligands. Thus, the prior art does not teach the subject matter of the present claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

A CAS online search for metal compounds containing the minimum structure $(C_5H_3R_2)M(OSnR'_3)(L^1)(L^2)$ where M is any metal, R is H or any substituent, and two R may be joined to form a ring (*i.e.*, indenyl) yielded two germane results.

Silva *et al.* (Polyhedron, 1999) discloses the niobocene complex $Cp_2Nb(Cl)(\mu-O)(SnPh_2Cl_2)$.

Herrmann *et al.* (J. Organomet. Chem., 1989) discloses a rhenium oxo complex, $Cp^*Re(O)(OSnBu_3)_2$.

The prior art made of record but not relied upon is considered pertinent to the Applicant's disclosure. The following patents have been cited to show the state of the art with respect to monocyclopentadienyl complexes containing heteroatomic ligands.

U.S. Patent No. 6,825,369 to Stevens *et al.*

U.S. Patent No. 6,410,657 to Ko *et al.*

U.S. Patent No. 6,271,322 to McCullough *et al.*

U.S. Patent No. 6,159,889 to Wasserman

U.S. Patent No. 6,020,439 to Ko *et al.*

U.S. Patent No. 5,962,362 to Wasserman

U.S. Patent No. 5,789,638 to Hahn *et al.*

U.S. Patent No. 5,340,892 to Kuramoto

U.S. Patent No. 5,196,490 to Campbell *et al.*

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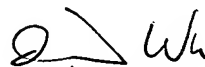
References not considered in Applicant's information disclosure of June 24, 2004 were deemed not relevant to the subject matter of the instant invention.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rip A. Lee whose telephone number is (571)272-1104. The examiner can be reached on Monday through Friday from 9:00 AM - 5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached at (571)272-1114. The fax phone number for the organization where this application or proceeding is assigned is (703)872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <<http://pair-direct.uspto.gov>>. Should you have questions on the access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll free).

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March 8, 2005



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